FREE-FLAP PHALLOPLASTY: COMPLICATIONS, PREVENTION STRATEGIES AND REALITIES OF REPAIR OPTIONS

Richard A. Santucci, MD, FACS, HON FC Urol(SA)

Crane Surgical Services-Austin (and San Francisco)

BRIEF INTRO

I am a reconstructive urologist (18 years) who has decided to devote the rest of my career to the "Mount Everest" of transgender surgery.

Newest member of Crane Surgical Services-Austin.

Formerly full professor and reconstructive urology Fellowship director at the Detroit Medical Center and newly (re)minted Texan.

INCIDENCE

Probably not truly known

Estimates of up to 1/200 Americans : 1.6 million

Perhaps 25% of transgender men want surgery: maybe 1/100 have bottom surgery

Perhaps 50% of transgender women want surgery: up to 30% get bottom surgery

205,850 people (0.66%) in 18-24 age range

967,1000 (0.58%) in 25-64 age range

PRACTICE HAD DONE OVER 600 PHALLOPLASTIES

IN ONE YEAR 2018 OUR PRACTICE DID:

Phalloplasty- 108

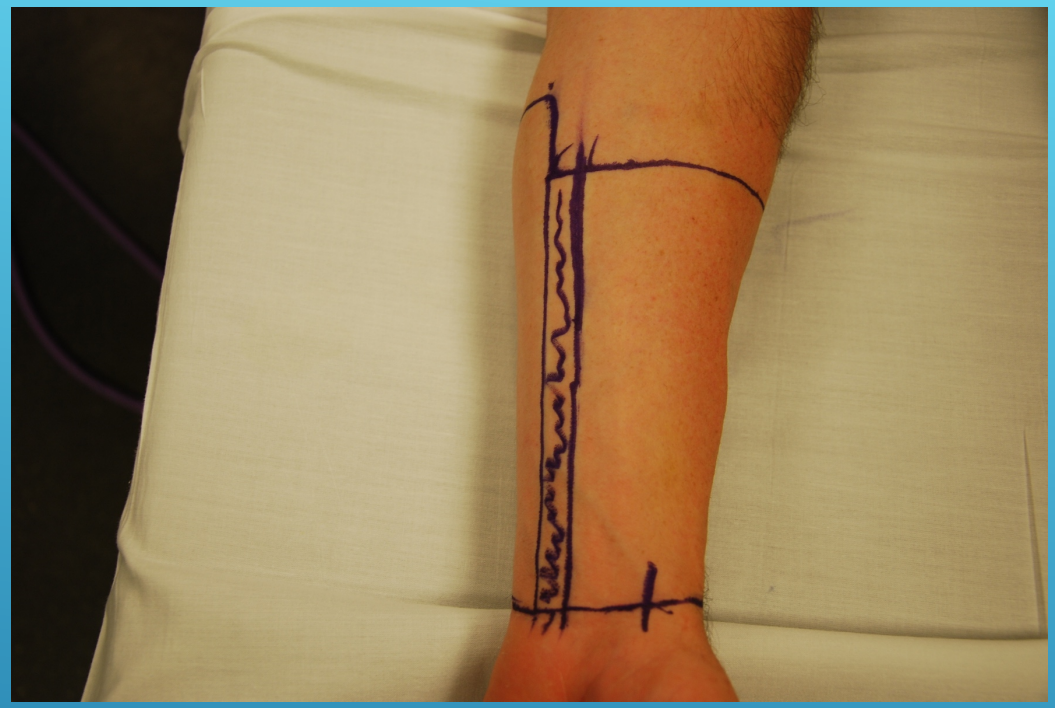
Vaginoplasty-139

Top surgery-124

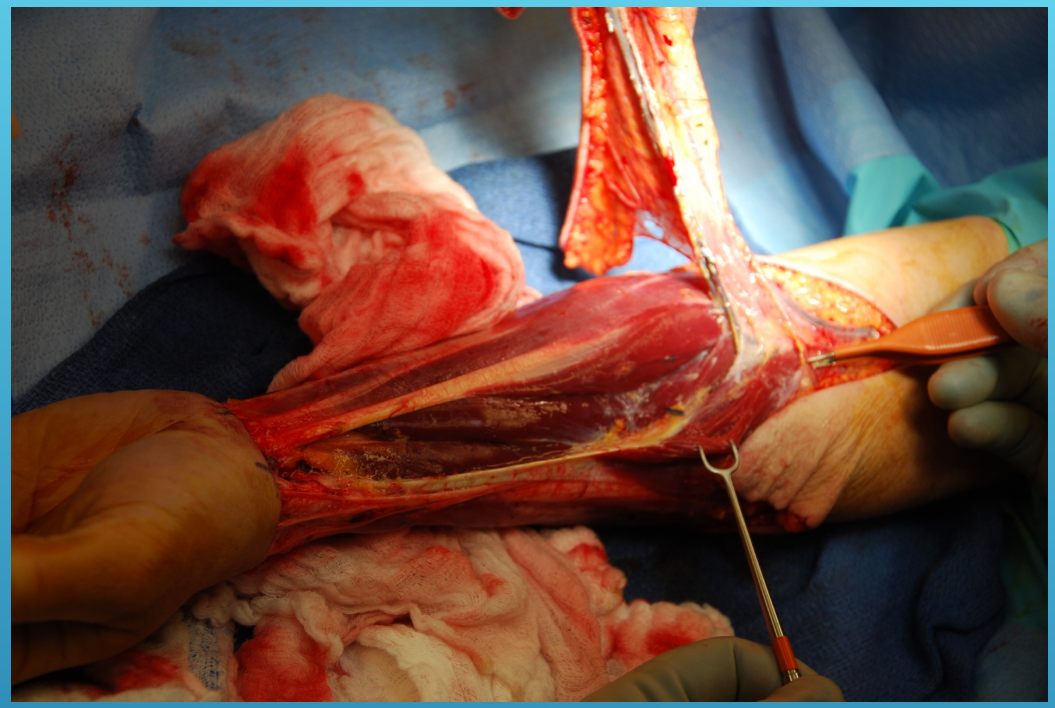
Penile Implants (in phalloplasty patients)-46

Metoidioplasty-24

HOW TO DO IT: FOREARM PHALLOPLASTY (AND VAGINECTOMY, SCROTOPLASTY AND URETHRAL LENGTHENING) IN 10 EASY STEPS



MARK THE ARM



CREATE URETHAL, PENILE, AND CORONOPLASTY PORTIONS WHILE PRESERVING NERVE, VEIN AND ARTERY

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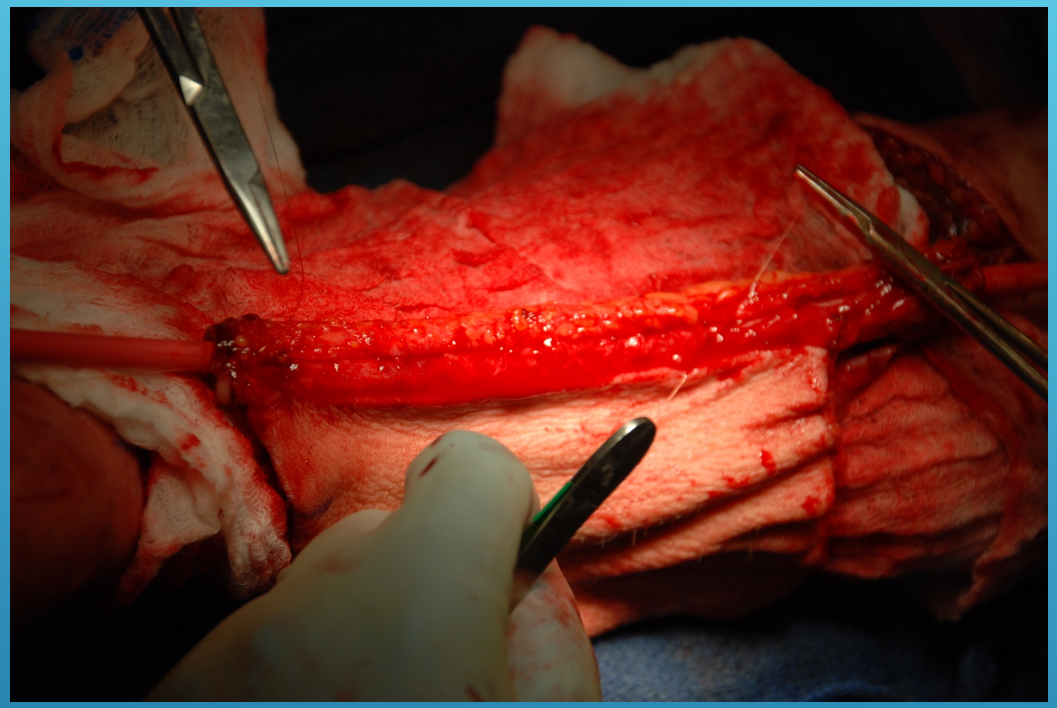

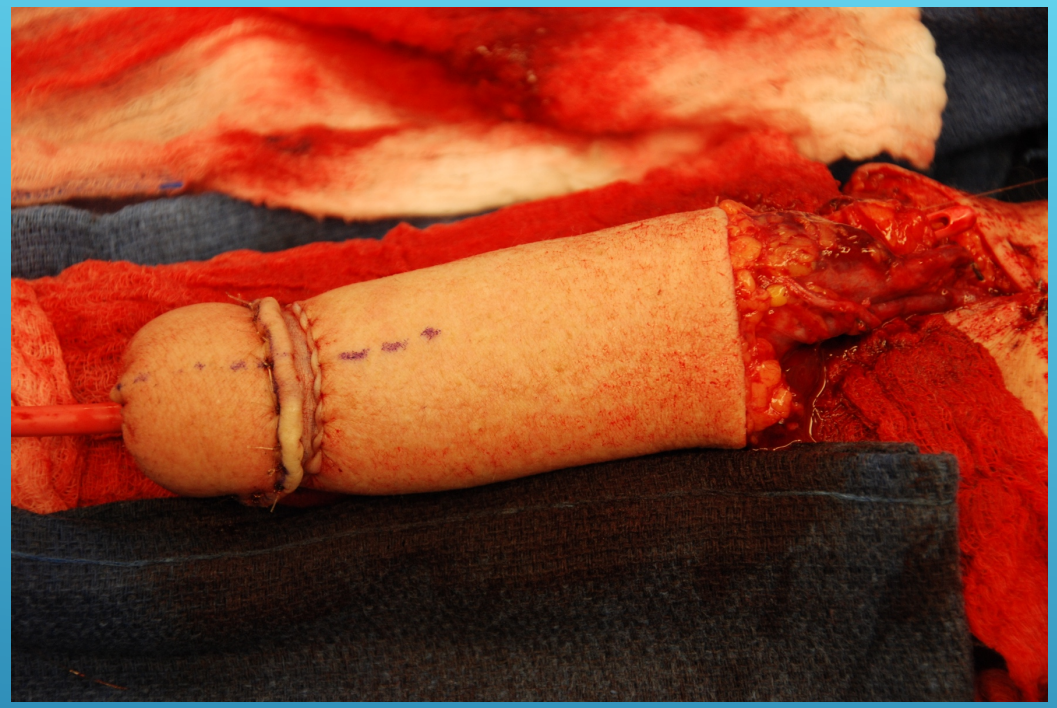

TUBULARIZE THE URETHRA/PENIS, CREATE CORONA

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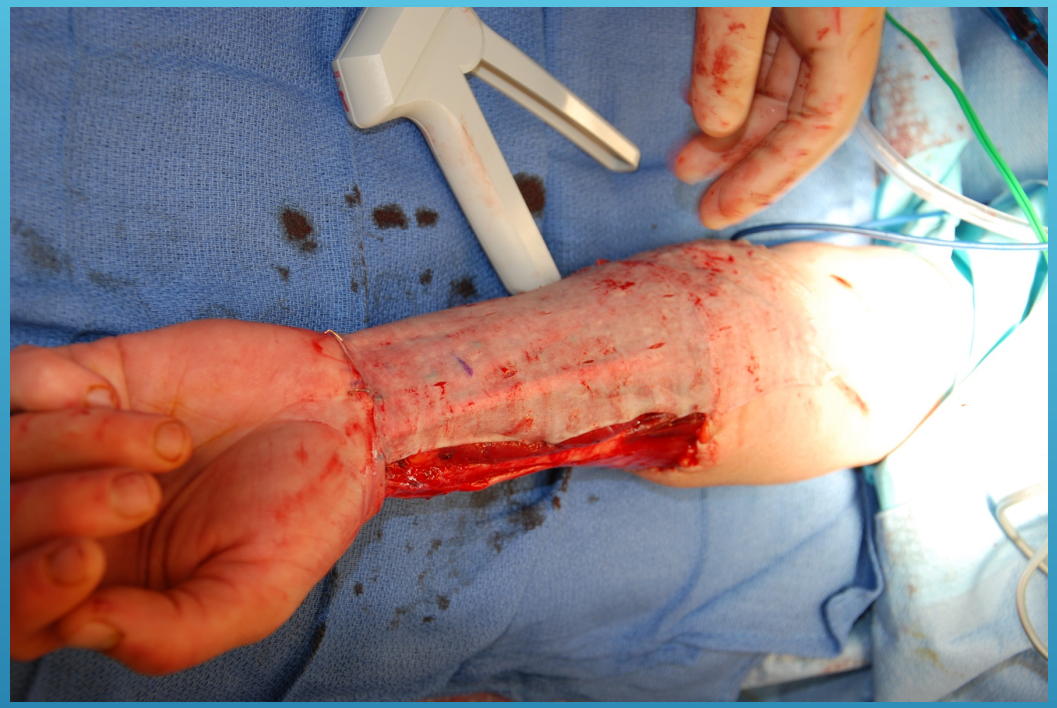

CLOSE THE ARM WITH LOCAL TISSUE FLAPS AND THIGH STSG. COVER WITH WOUND VAC.

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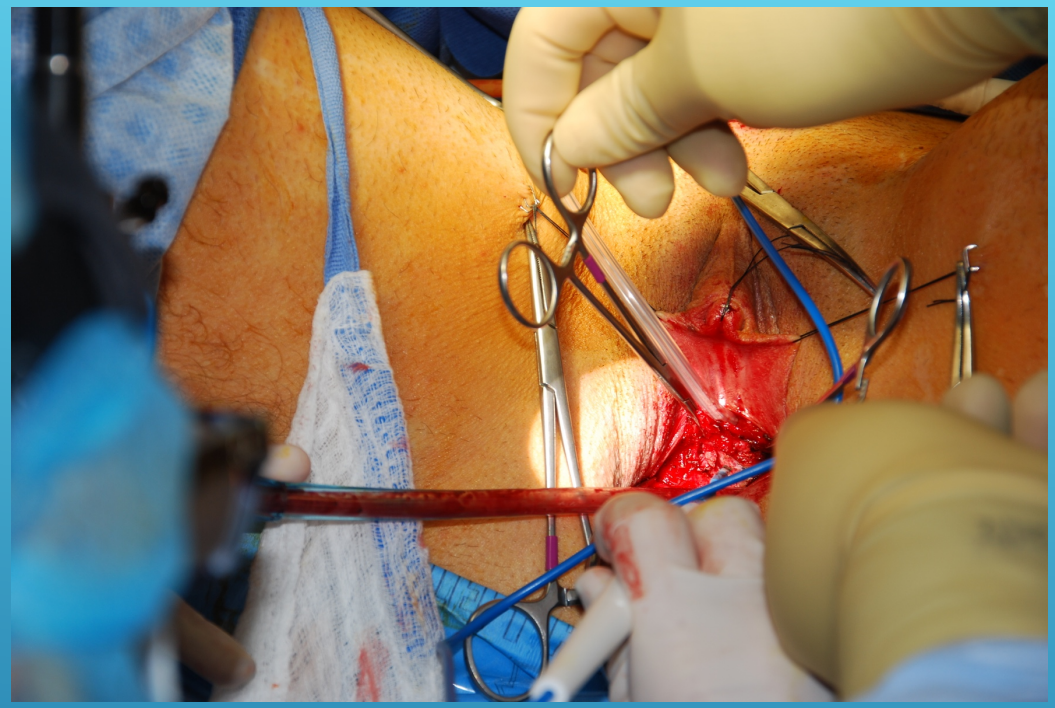

VAGINECTOMY

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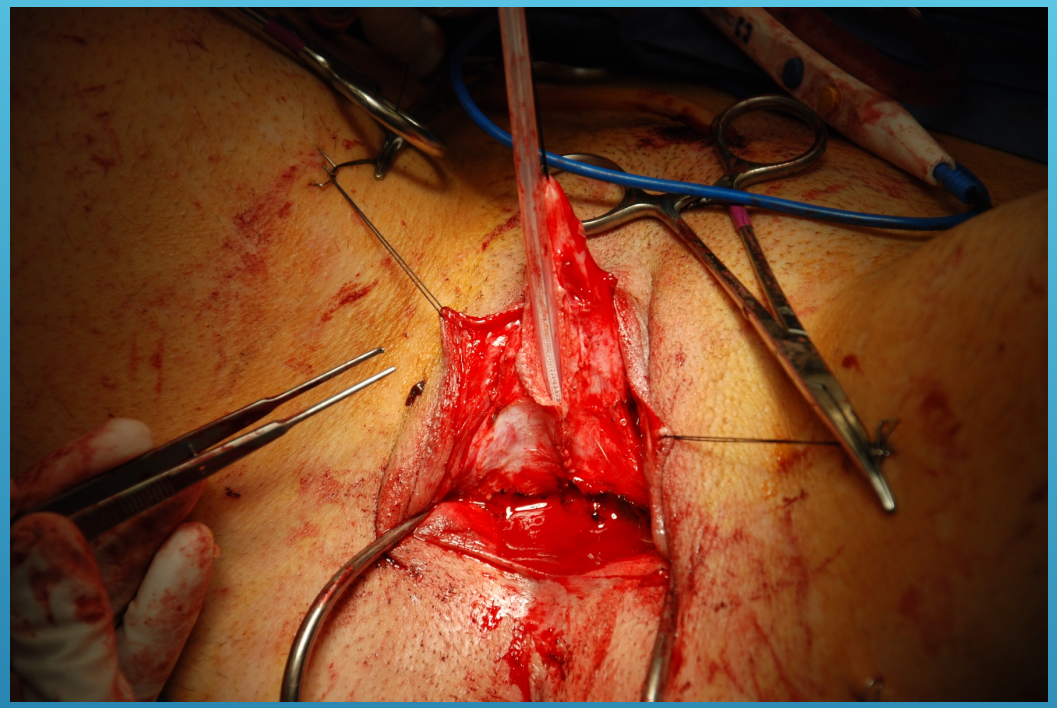

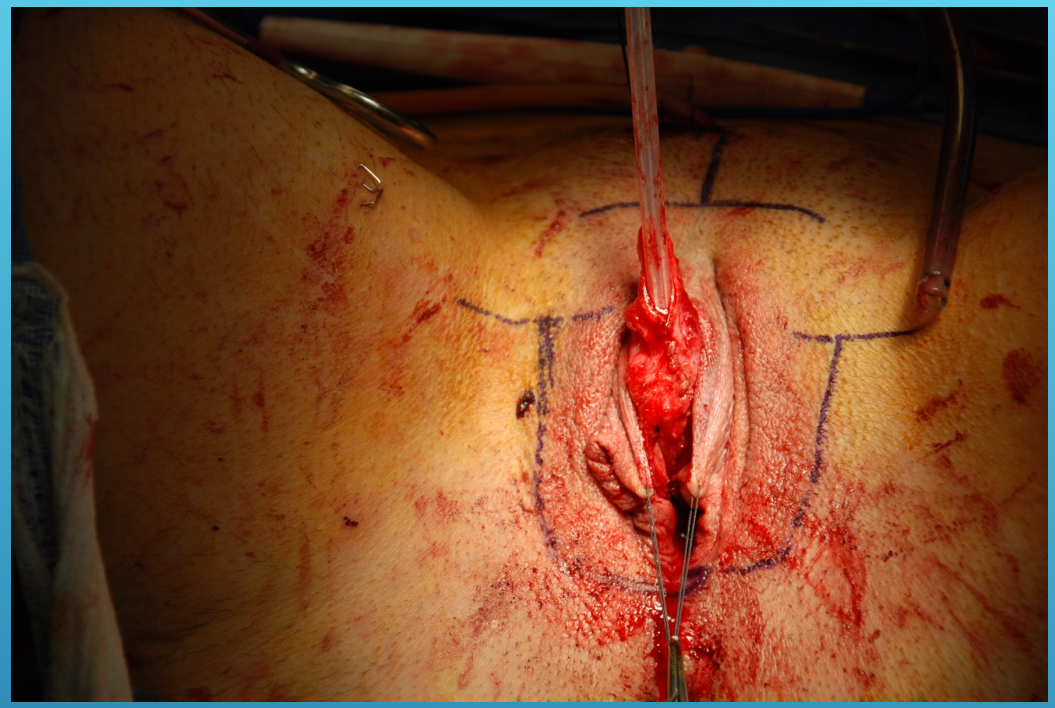

FREE UP THE CLITORIS, URETHRAL LENGTHENING

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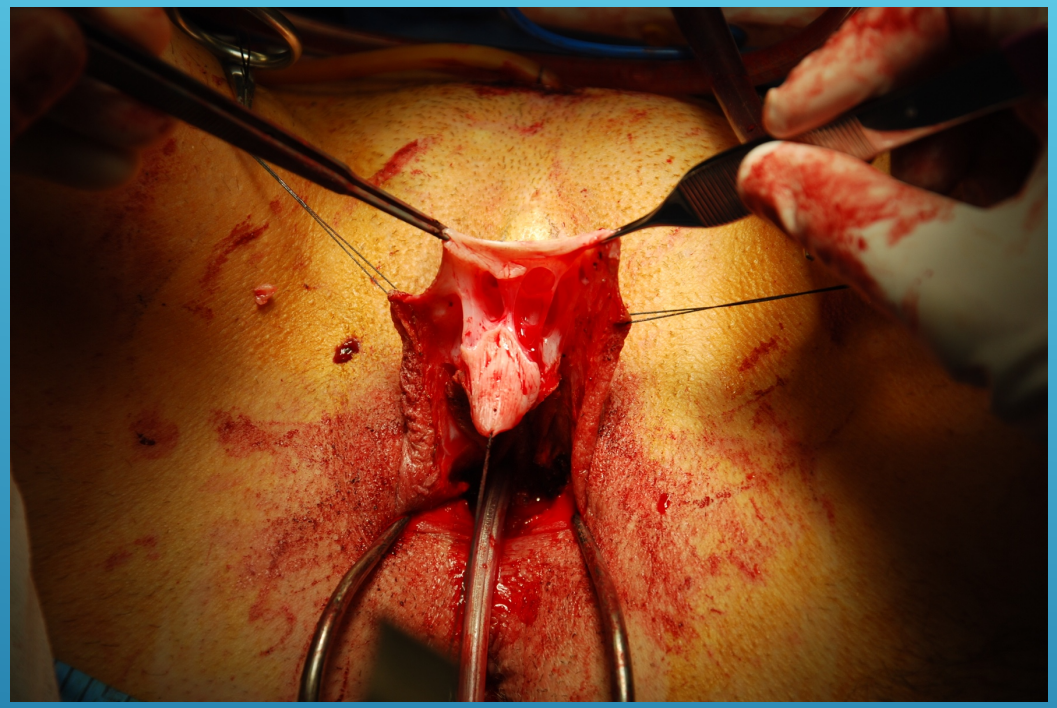

CLITORAL REDUCTION AND CREATION OF NEOPALLUS BASE

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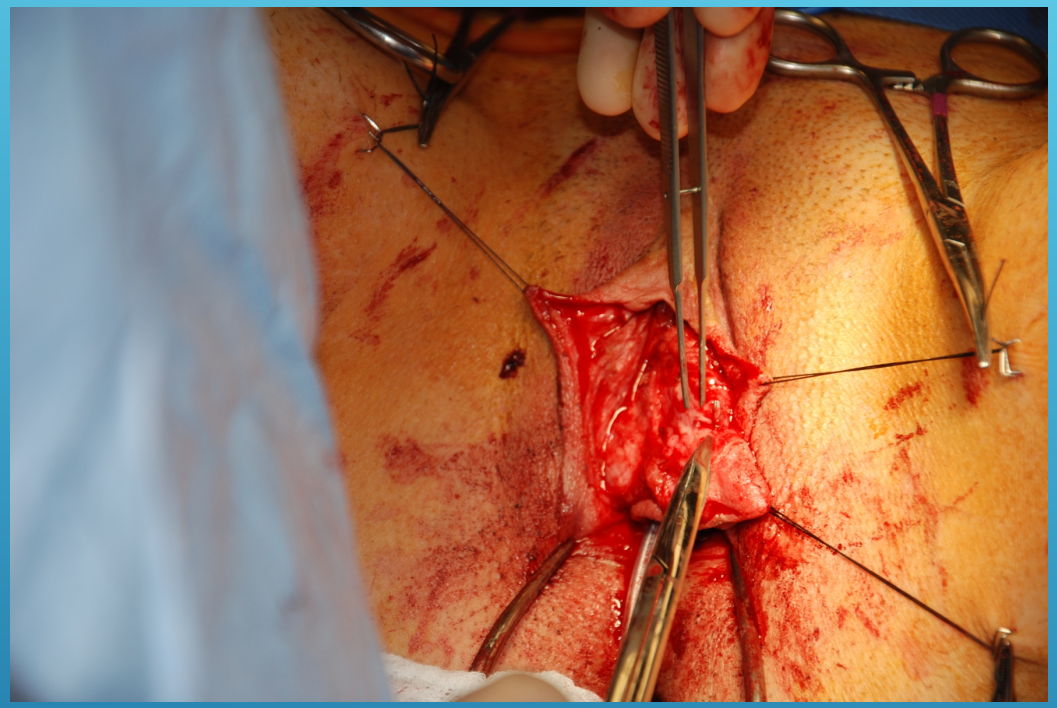
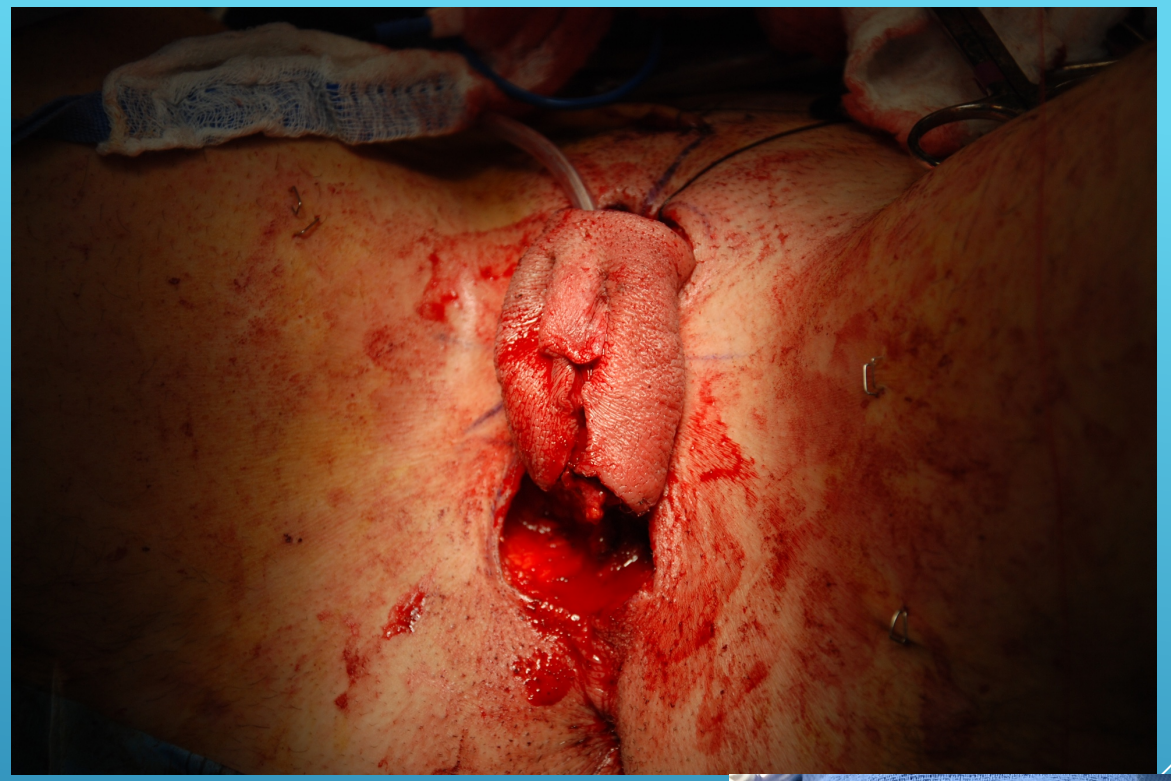


FIND AND EXPOSE A CLITORAL NERVE



CREATE NEOSCROTUM

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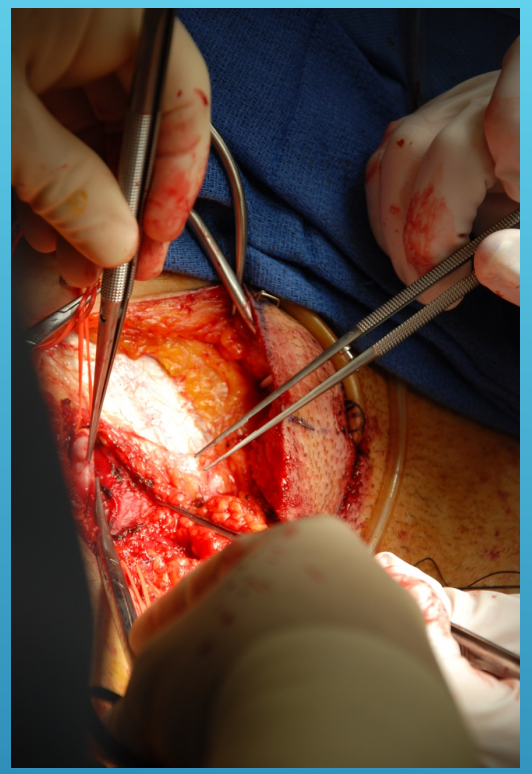

MICROVASCULAR ANASTOMOSIS OF ARTERY/VEIN. CONNECT NERVE

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Voila

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QUICK INTRO TO ALTERNATE METHOD: ANTERIOLATERAL THIGH FLAP PHALLOPLASTY (ALT="LEG")

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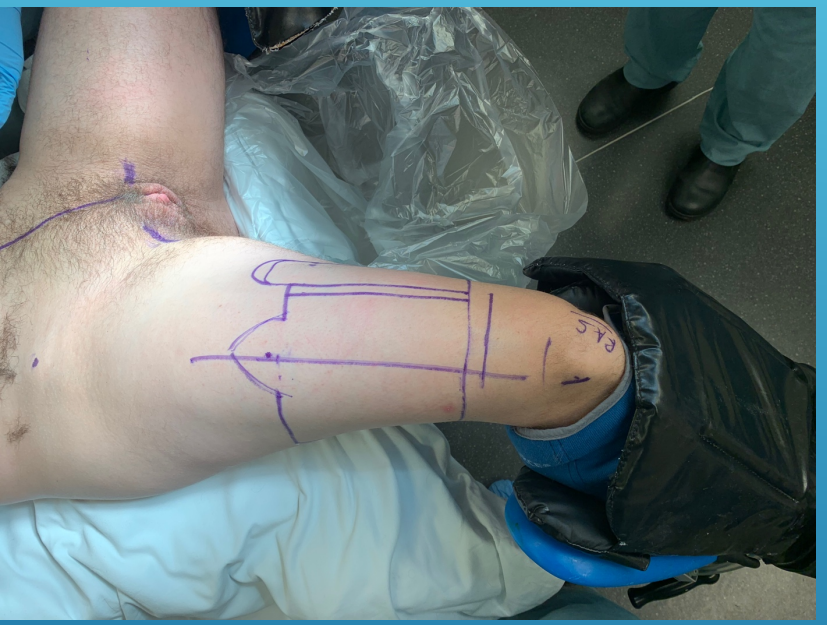
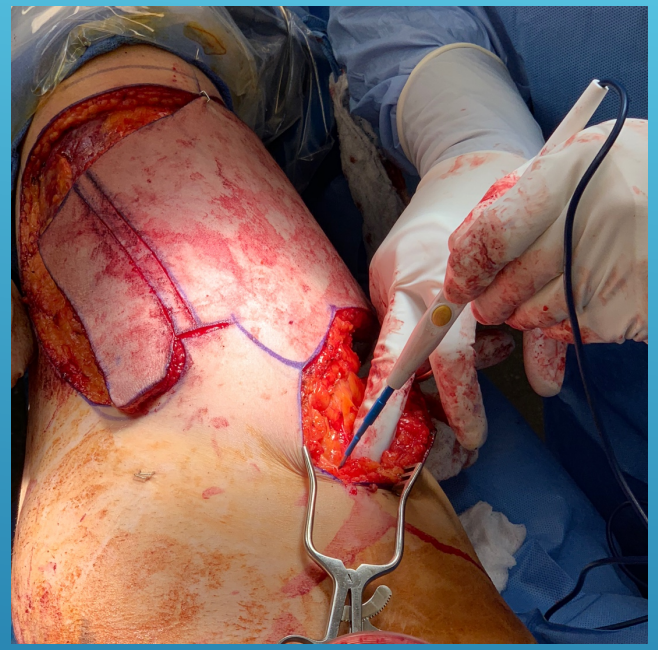
ALT

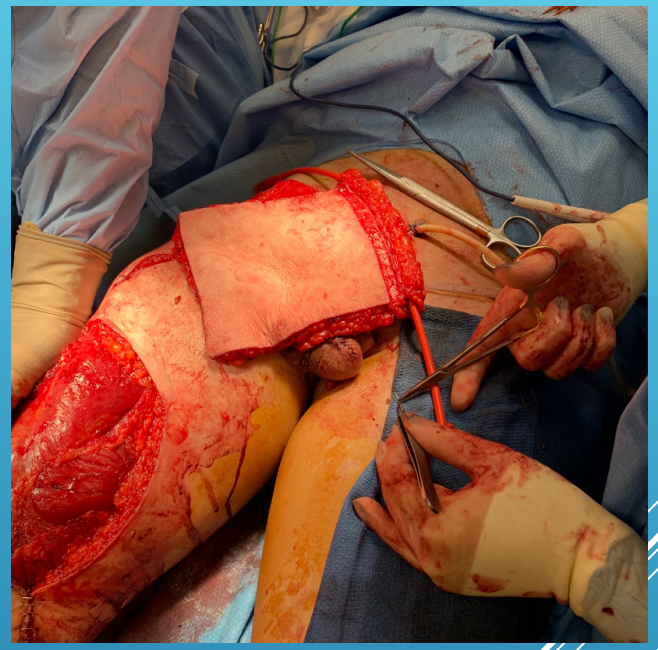
Mark



Free up pedicle

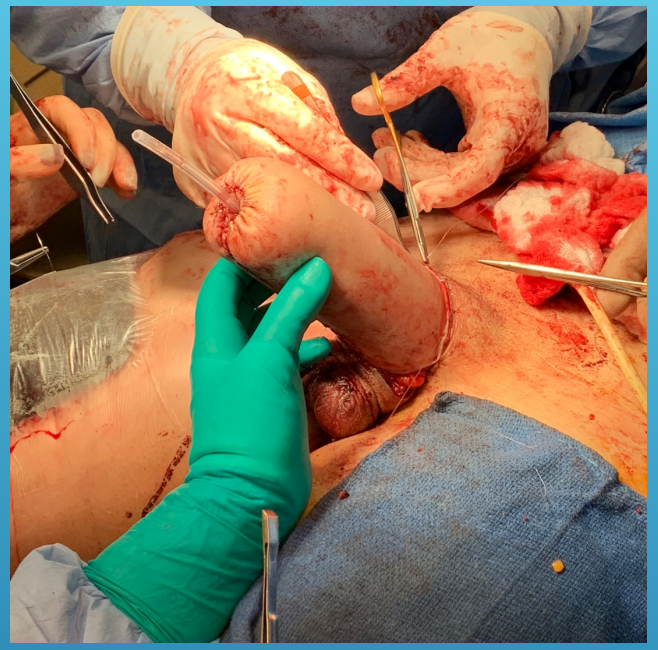


Make urethra



Move under muscles

Inset (affix) in place



ALT STEPS

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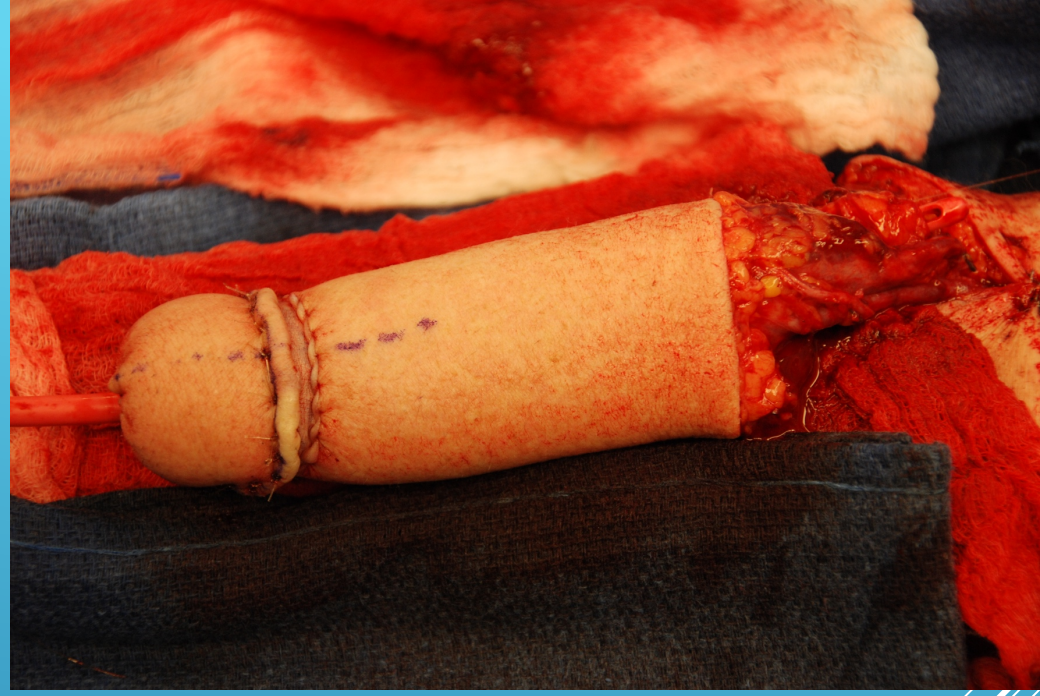
GENERAL COMPLICATIONS OF PHALLOPLASTY

"The 1/10/40/100 rule"

1%: THE RISK OF MAJOR VASCULAR DISASTER



A 12 hour surgery(we do it in 6 with two simultaneous teams): massive operation.

An 22X16 cm wide flap of skin, fat, blood vessels and more is freed, folded twice, and then moved a long distance to a new location. It relies on just ONE LITTLE artery and vein to keep it alive/well.

Flap surgery invented 1970's. When used, usually 10X6 cm flap. This pushes the limits of flap technique

THE ARTERY CAN CLOT UNEXPECTEDLY, CREATING A HUGE SURGICAL EMERGENCY. IF BLOOD FLOW CANNOT BE RESTORED, THE PHALLUS IS LOST WITHOUT IMMEDIATE INTERVENTION.

THE VEIN CAN CLOT. THIS IS ALSO AN EMERGENCY BUT LESS DRAMATIC IN PRESENTATION.

10% CHANCE OF A "NOTABLE" COMPLICATION WHILE IN HOSPITAL

These tend to be unexpected and a sometimes a bit random. Like….

1. Hematoma near vessels, that requires surgical evacuation
2. Pneumonia (bed rest, narcotics, sedatives, big surgery)
3. Problems with the hand blood supply requiring acute reexploration and vessel grafting
4. New carpel tunnel syndrome requiring immediate carpel tunnel surgery (more than once)
5. And more….

40% URINARY COMPLICATION RATE…. ABOUT 20% FISTULA AND ABOUT 20% STRICTURE

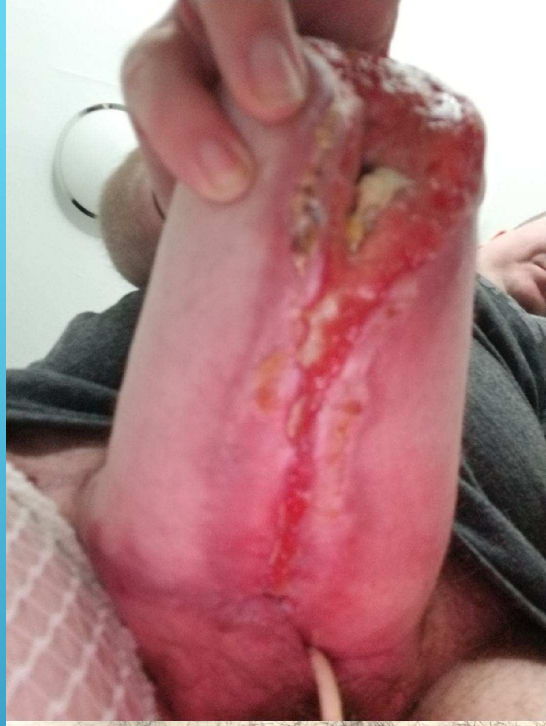
Historically had a 50% (!) rate, fell over time to 23-35% in contemporary series.

However the literature is “silo-ed”, single center, “smallish” numbers and skimpy

Big thigh=big phallus
Secret smoker until 3 days of surgery=edge loss
Too fat phallus to make urethra in first stage

100% MINOR COMPLICATION RATE

- Small dehiscences
- Necrosis of the flap edges of the flap: the areas with the worst blood supply
  - "the Edge Problem"
- Small abscesses
- (late) Asymmetric healing, significant scarring
- And more



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ALT (LEG) VS RFF (ARM) PHALLOPLASTY COMPLICATIONS: WHICH ONE IS BETTER

Truly, one is not better than the other. They both have unique benefits and costs.

Quickest summary

1. RFF (arm) THE GOOD
    - Normal size/configuration penis out of the box
    - Slightly more robust blood supply
        - Less fistula?
    - Better nerve density? --unproven
2. RFF (arm) THE BAD
    - One must accept microvascular (1%) or other acute problems that send pt back to the operating room (3%)
    - Arm scar

ALT (LEG) VS RFF (ARM) PHALLOPLASTY COMPLICATIONS

1. ALT (leg) THE GOOD
   - No artery/vein connection needed: you bring artery/vein with you from the leg up to the groin
   - No arm scar
2. ALT (leg) THE BAD
   - Always a "too fat" phallus out of the box that requires one or more liposuctions and maybe other size reduction surgeries
   - Slightly less robust blood supply
     - More fistula?
   - Less nerve density?--unproven

   - <u>A reality of ALT. If you have a thigh with a lot of fat, you will have a fat penis.</u>

ALT (LEG) VS RFF (ARM) PHALLOPLASTY COMPLICATIONS CONTINUED…

- The dicey blood supply to this area can mean:
  - The surgery is NOT POSSIBLE, and the flap must be "delayed" and completed in 6 months. 3%?
  - The phallus can be constructed but the urethra can't in first stage. Do in 6 months

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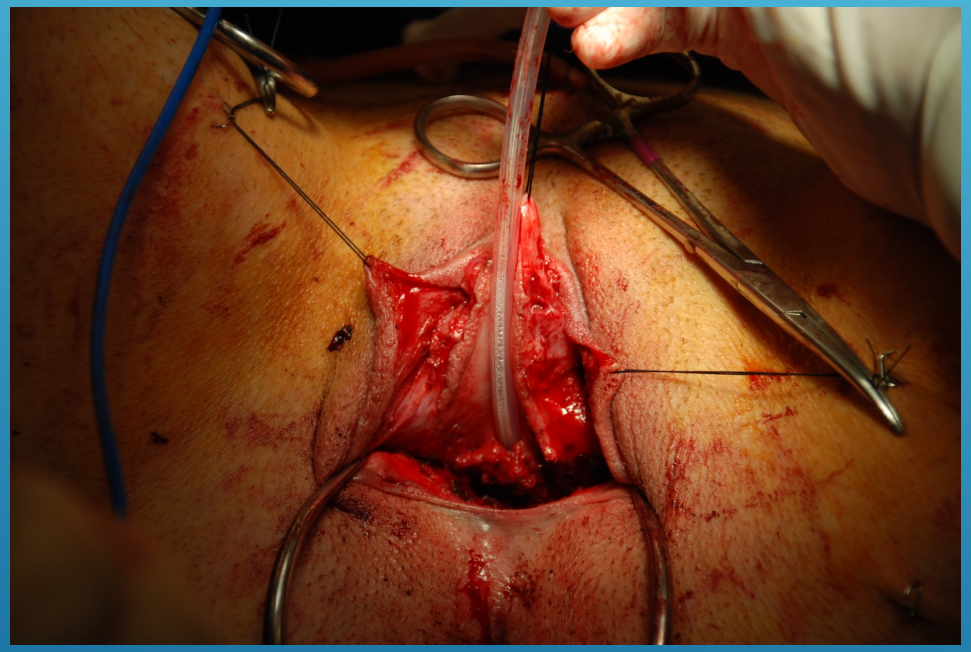
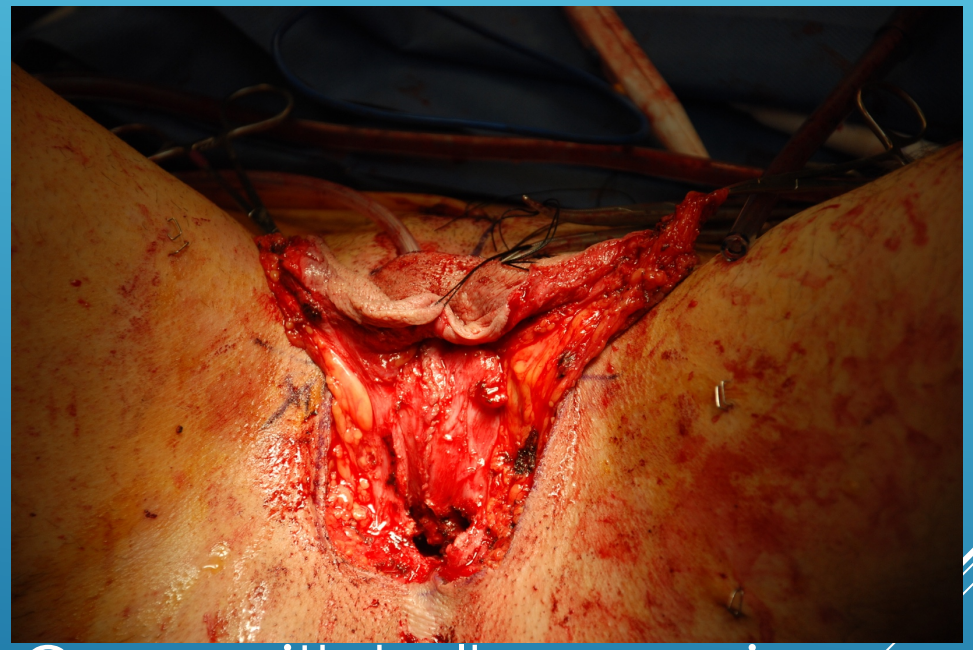
BACK TO URETHRAL STRICTURE

NO MAGIC FOR ELIMINATING STRICTURES, BUT GOOD STRATEGY TO DECREASE IN THE "PARS FIXA": ROBUST FLAPS, GOOD SECONDARY COVERAGE



Use well vascularized perivaginal flaps to create urethra



Cover with bulbospongiosus muscle proximally and periurethral tissue (dartos?) distally

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AND…MAKE URETHRAL TEMPLATE LONGER THAN PENIS TEMPLATE TO ALLOW WELL SPATULATED TENSIONLESS URETHRAL ANASTOMOSIS

SOME DATA TO SUPPORT THE BENEFITS OF GOOD SECOND LAYER TO APPROACH IS INDIRECT:

In patients who did not have vaginectomy at time of phalloplasty, and thus these flaps were not available, had 2.5 fold higher urethral stricture rates (37% stricture in perivaginal flap patients rising to 67% stricture in those without perivaginal flaps).

About 40% rate of fistula if you DON'T do a simultaneous vaginectomy

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WHAT ABOUT……..

1)staged surgery (vaginectomy and urethroplasty followed by later phallo when healed)?—YES if you accept the math of two surgeries instead of one

2)Prelaminated arm grafts with buccal or vaginal mucosa?--NO

3)Supporting urethra with gracilis flap?—Maybe, and must accept the increased risk/time of graciis harvest

We tend towards a one stage procedure with an industry-low 22% stricture rate.

Surely staged procedures will have fewer (or at least spaced out) complications but at a high cost in $$$$ and patient convenience.

Gracilis flap extra coverage conceptually excellent but currently experimental, and worth the time/morbidity?

Gracilis flaps clearly decrease the rate of fistula……

Time/research will tell.

TRUTHS:
IN CASES OF URETHRAL STRICTURE, URETHROPLASTY IS ULTIMATELY REQUIRED IN 94-96% OF AFFECTED PATIENTS.

SURGERY SHOULD BE DELAYED UNTIL ALL ACUTE INFLAMMATION HAS SUBSIDED. (6 MONTHS? MORE?)

URETHROPLASTY CAN BE TECHNICALLY CHALLENGING AND FAILS IN UP TO 50% OF CASES. (OUR RATE 80% (?) SUCCESS)

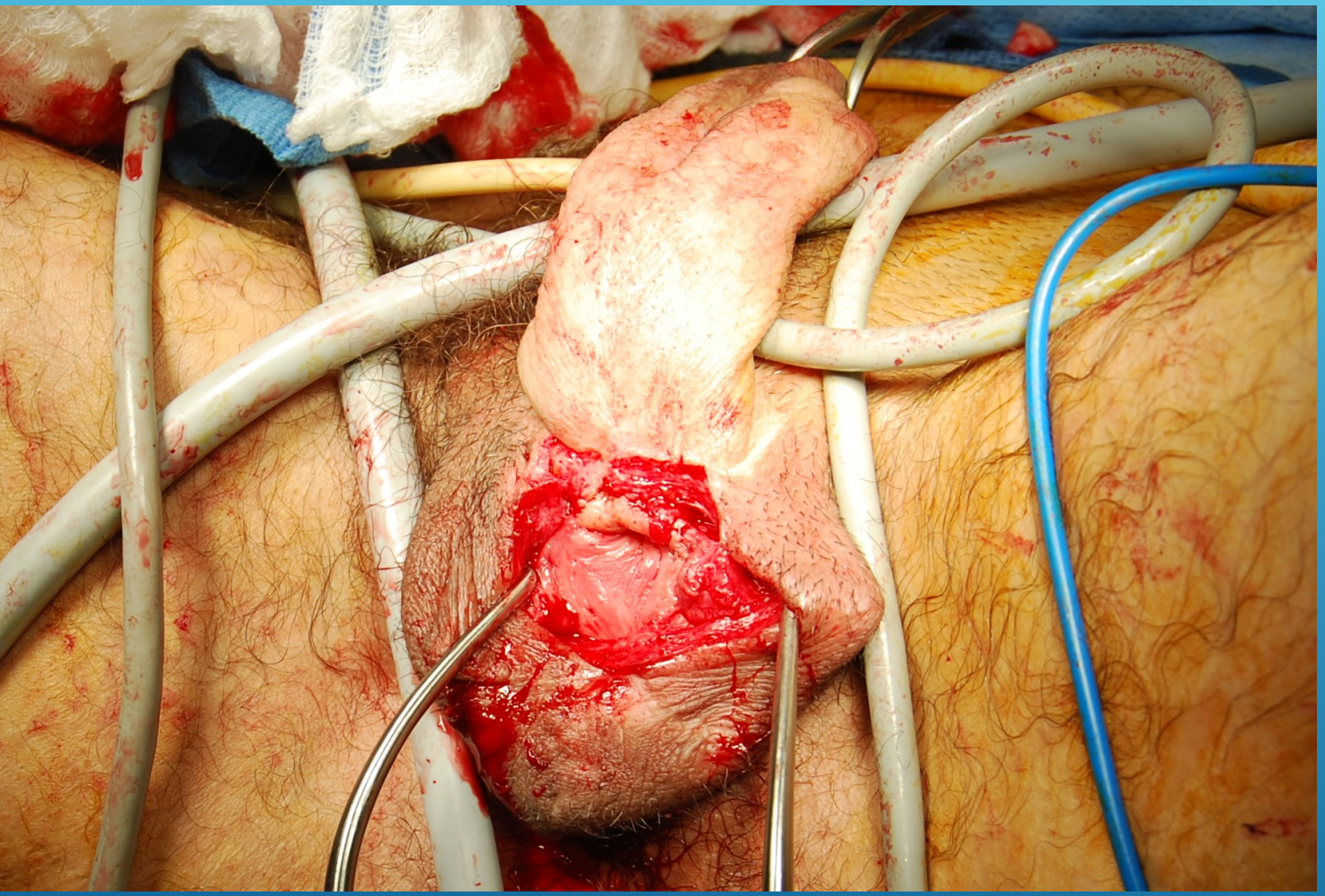
REPEATED SURGERY CAN BE REQUIRED.

Two common locations generally requiring two different approaches:

At the labial urethra (pars fixa)-forearm flap anastomosis—generally short-anastomotic

In the phallus (usually the tip)—generally longer—usually two stage (Johanson) approach but maybe can be done in one stage especially with soft, well vascularized phallus

ANASTOMOTIC URETHROPLASTY



Usually for anastomotic strictures, usually short, between (proximal) labial urethra and (distal) phallo urethra.

Often can be done as Heineke-Mikulicz type repair where the ventral urethra is incised longitudinally and closed transversely.

Also as "standard" anastomotic type repair.

If fails? Repeat or convert to a two stage Johanson type repair……

OR alternatively do complicated double" dorsal/ventral urethroplasty

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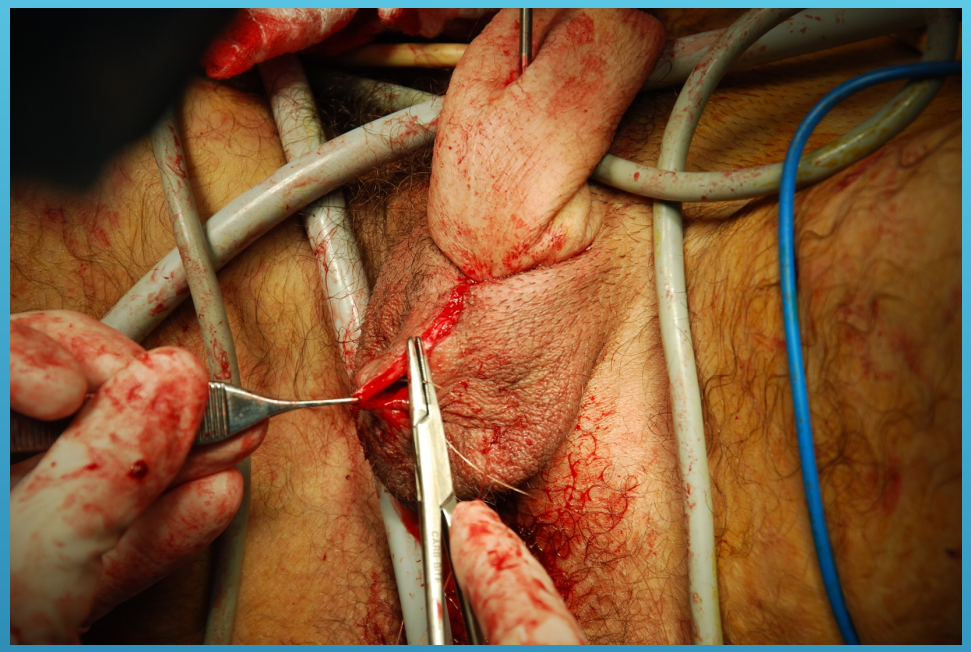

ANASTOMOTIC URETHROPLASTY CLOSURE

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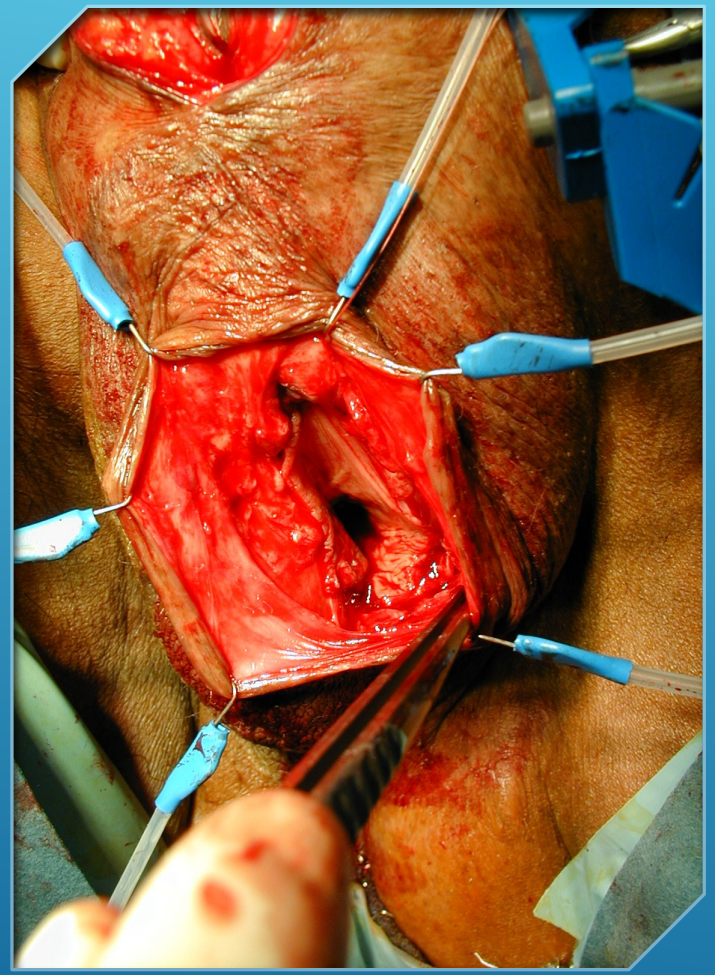

BONUS ROUND

Same operation (nontransecting anastomotic urethroplasty using ventral Heineke-Mikulicz technique) but a different patient

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For penile urethral strictures: often longer

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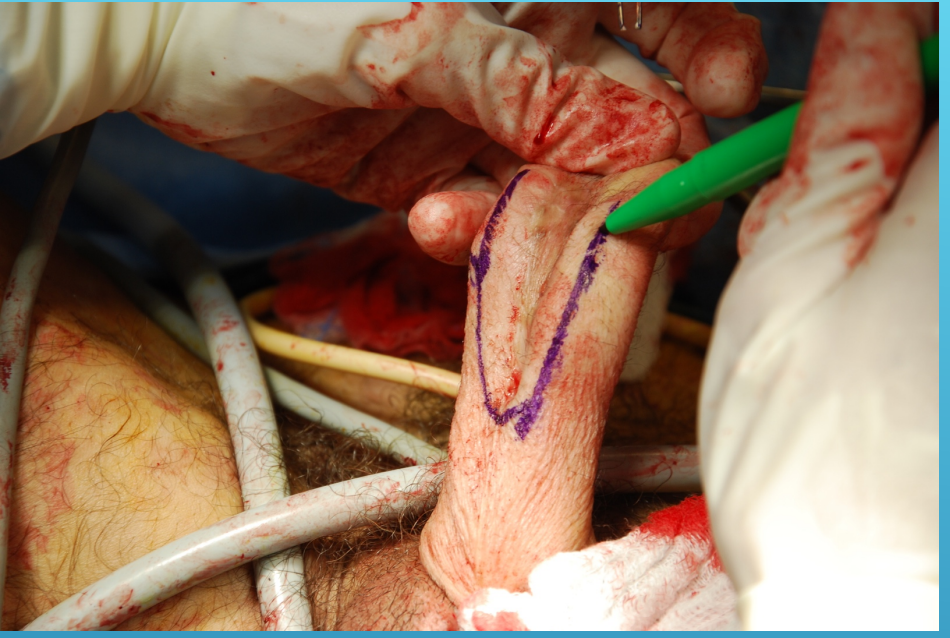
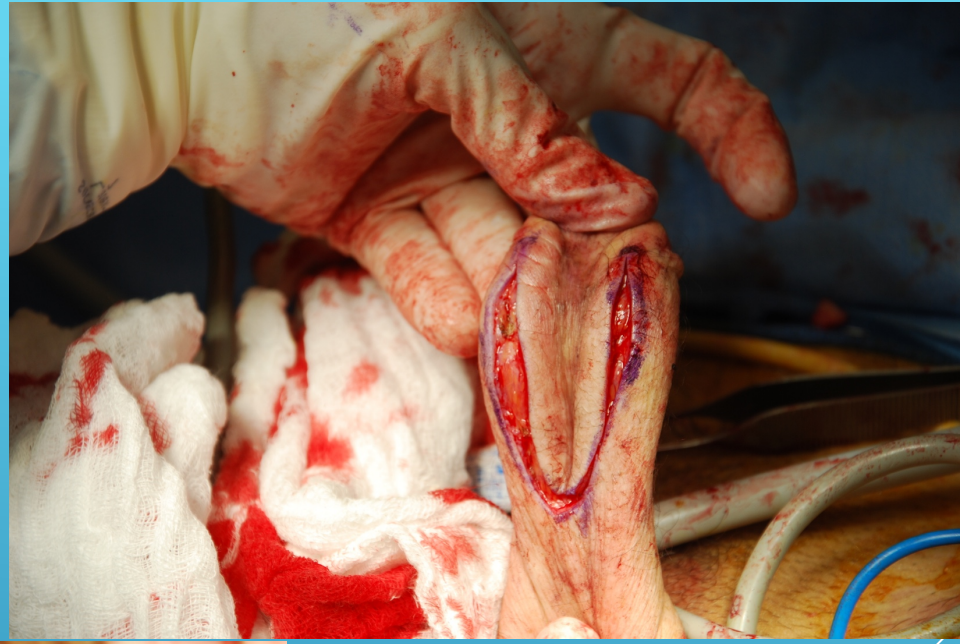
"JOHANSON TYPE" ONE STAGE WITH DORSAL SPLIT THICKNESS SKIN GRAFT (STSG)
ALSO MIGHT BE CALLED "ASOPA"

Get full thickness skin from flank: thin by hand to split thickness

Surely ONE stage has a higher failure rate than two stage, but a reasonable approach in first occurrence of stricture in penile location, and where penis is supple and well vascularized



Second Stage Johanson Urethroplasty—6 months later



Make a WIDE urethral plate (4 cm?)

Close in many layers.

Suprapubic tube a must.

BONUS ROUND: REPAIR OF MATURE FISTULA

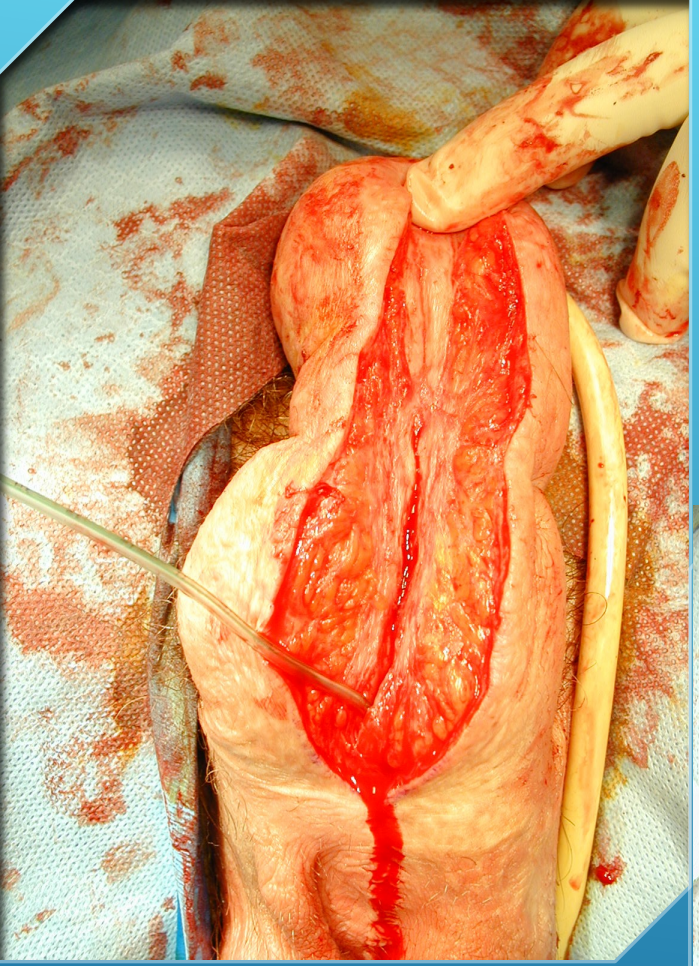
Again occurring in the angle of sorrow between the most tenuous portion of the labial urethra and the most tenuous portion of the phallo skin urethra

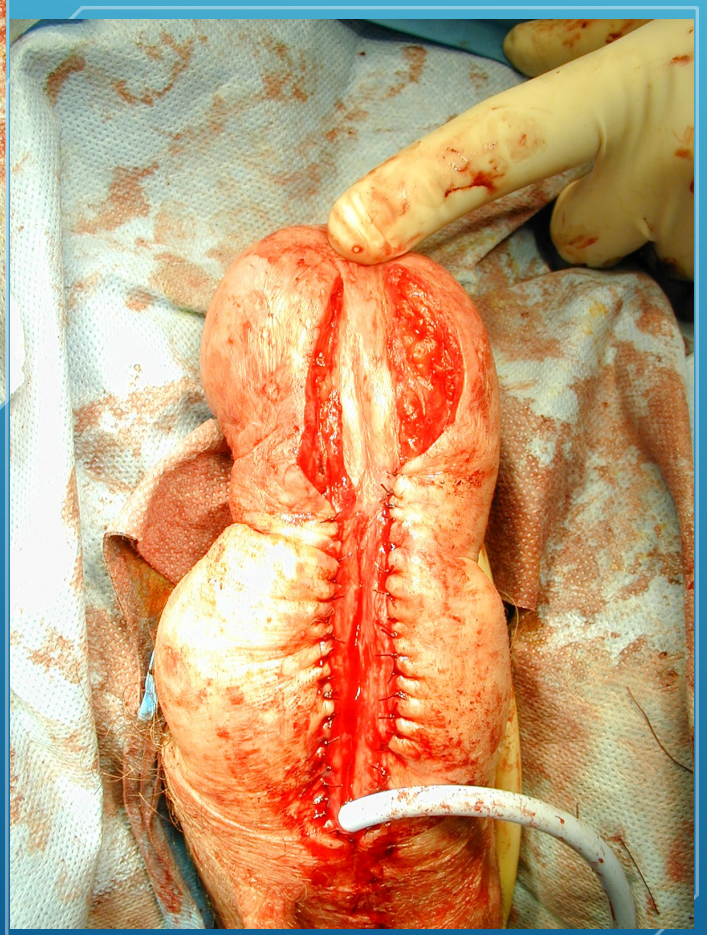
Wait for all acute inflammation to subside (6 months)

Cover with many periurethral layers

Consider configuring incision to allow non overlapping suture line (open longitudinally, close transversely)

TOUGH CASE. LONG PENILE STRICTURE IN "OLD" NON-MICROVASCULAR FLANK PHALLOPLASTY

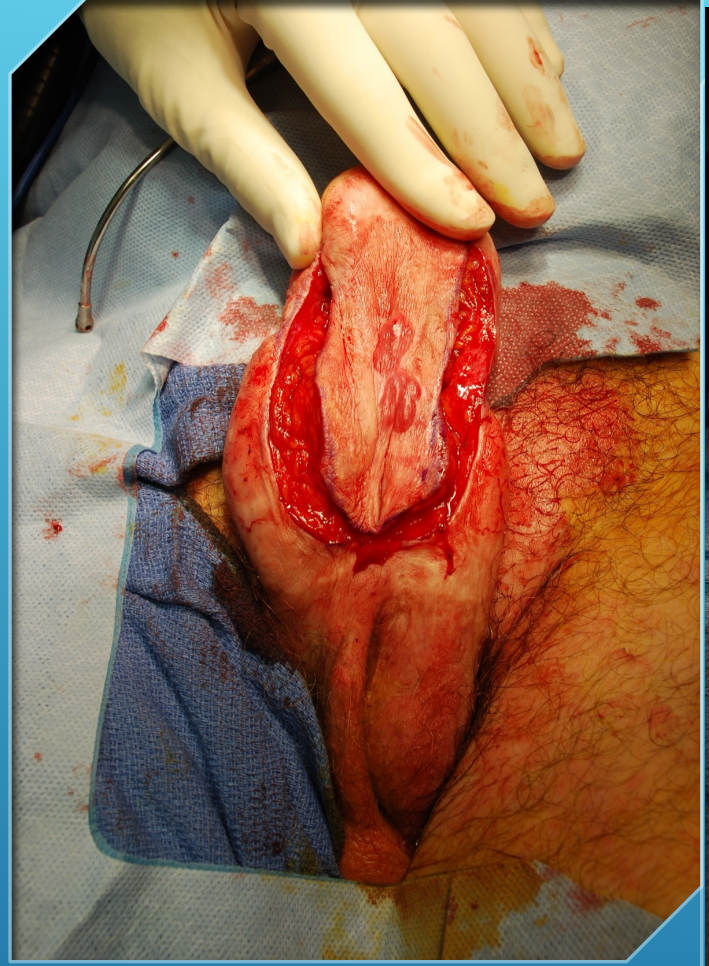


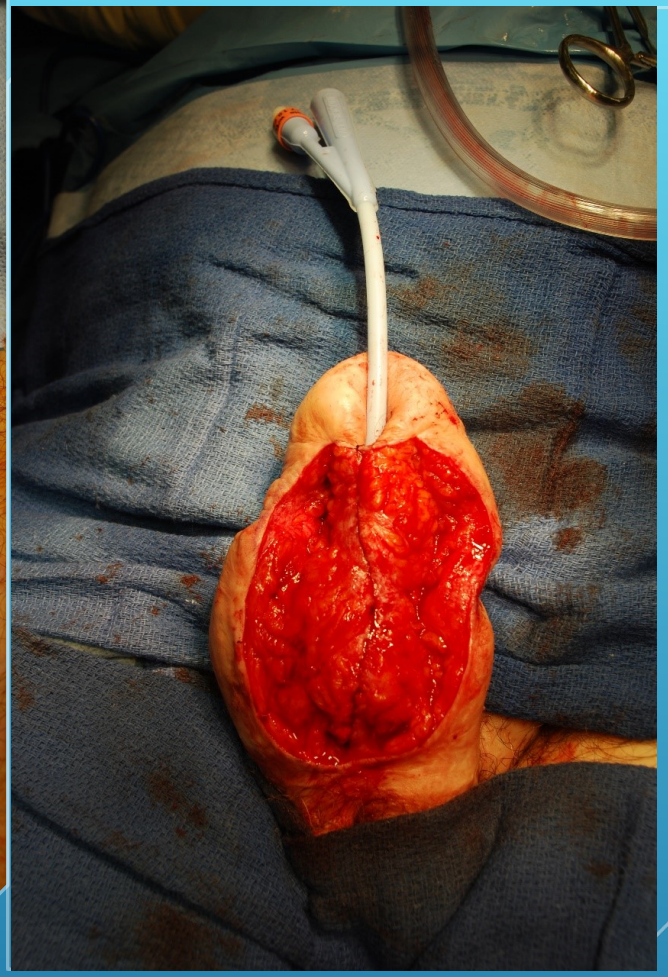


Stricture is long

Penis is not supple or particularly well vascularized

Proximal portion can be done without STSG, distal requires grafts in first stage





SECOND STAGE JOHANSON ON SIMILAR PATIENT WITH BUCCAL GRAFTS IN FIRST STAGE

Note terrible "take" of buccal grafts.

Buccal VERY useful in cis-male urethra but limited use in PENILE LOCATION phallo urethra

Use skin graft (flank, thinned, close donor primarily)

Place a suprapubic tube in all these patients

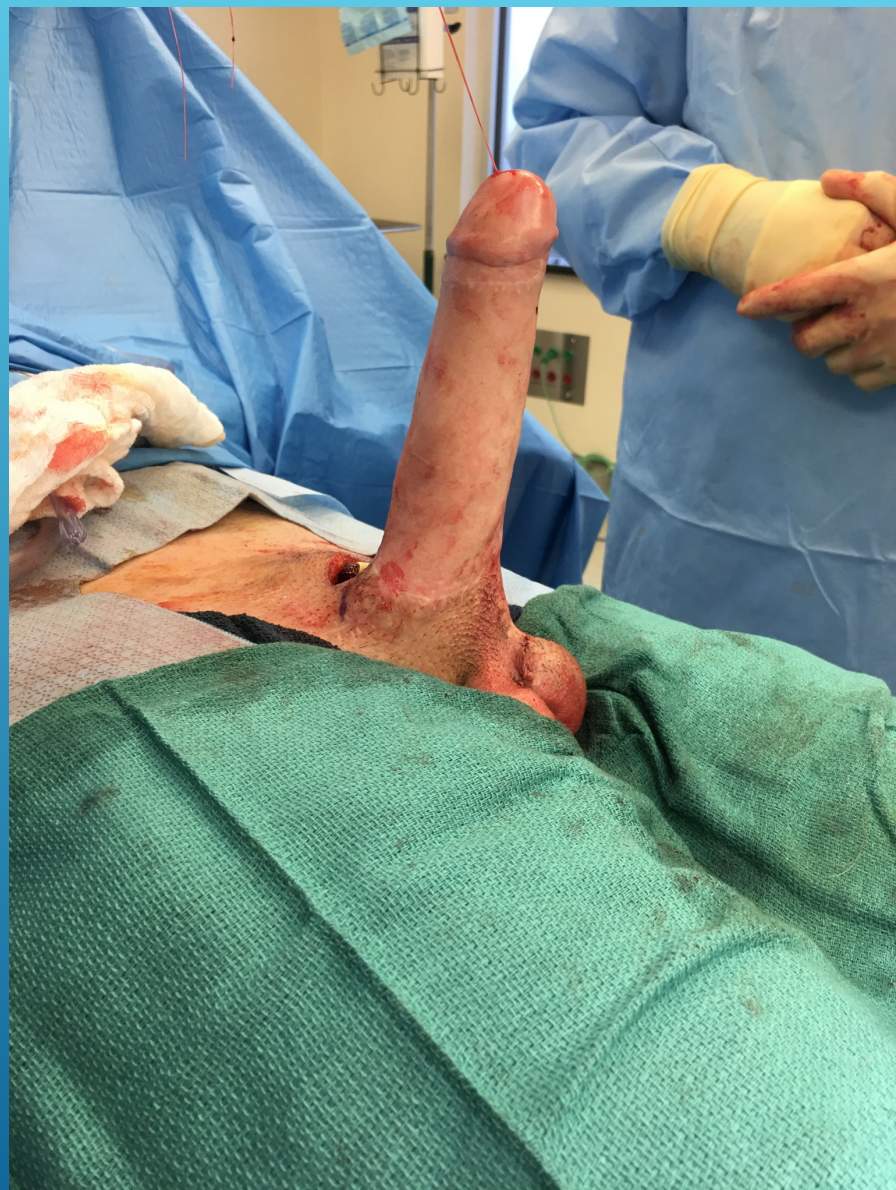
PENILE PROSTHESIS COMPLICATIONS (IN BRIEF)

17% infection/revision/all cause removal in first year

100% all cause revision by 4 years? (ours lower)

If it survives that first year, each year there is a certain chance it will a)break b)move c)erode the phallus and it will have to be removed or replaced

It is sewn into the BONE and while this is done diligently with unbreakable titanium sutures, it can come unmoored



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PENILE PROSTHESIS: SEMIRIGID AND INFLATABLE, EITHER WORKS

One is not really better than the other. Both have costs and benefits.

1. Semirigid GOOD
   - Simple design
   - Never or almost never breaks
2. Semirigid BAD
   - Always have an erection. Its either bent UP or bent down
   - Semi rigid end pushes on the soft fat of the delicate phallus flap, and may push all the way to the level of skin
     - Late, after years?

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PENILE PROSTHESIS: SEMIRIGID V INFLATABLE

1. Inflatable GOOD
   - More "natural" erection that can be pumped up and down
   - Less erosion?
2. Inflatable BAD
   - More complicated: can break
   - 3 parts: abdominal component (reservoir), penile cylinder and testicle "pump" in scrotum. Any one of these can migrate or be a source of revision.

THANK YOU!

Richard@brownsteincrane.com